



DEPARTMENT OF HEALTH
AND ENVIRONMENT

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www.kdheks.gov

Flood Safety:

Precautions to Take Before, During and After Flooding

Be Prepared

Know the history of flooding in your area, and learn about your chances of being flooded.

Find out how many feet your property is above or below flood level. Ask your county emergency management office or insurance agent if your home is located in a flood plain. Ask about how to get flood insurance – regular property and casualty insurance does not cover flooding.

Know the best routes for traveling to a safe place in case of flooding. Become familiar with your area. Know where you are, where high ground is and how to get to high ground quickly. Choose elevated, paved roads that are far away from streambeds, gullies or drainage channels. Make sure your car always has enough gas to reach safety.

Purchase a NOAA Weather Radio with a warning alarm tone and battery backup, and listen for flood watches and flood warnings. A flood watch means heavy rains that may cause flash floods are occurring or expected, and residents should be ready to evacuate. A flood warning means flash flooding is occurring or expected soon, and people in the area should evacuate to a safer area right away. Weather radios today can be easily programmed to receive only the local watches and warnings that affect you.

Store enough emergency supplies in a watertight container for one week:

- ☐ **Water:** At least one gallon of water per person per day (7 gallons per person)
- ☐ **Food:** At least a seven-day supply of non-perishable foods
- ☐ **Disposable cups, plates and eating utensils**
- ☐ **Manual can opener** if your kit contains canned food
- ☐ **Battery-powered radio and extra batteries**
- ☐ **Flashlight and extra batteries**
- ☐ **First-aid kit and guide:** Know basic first aid.
- ☐ **Whistle** to signal for help
- ☐ **Sleeping bag or blanket** for each family member
- ☐ **Maps and compass** to keep from getting lost if evacuating
- ☐ **Pencil and paper**
- ☐ **Prescription medications in childproof containers** for each family member
- ☐ **Reading glasses and extra eye glasses**
- ☐ **Infant formula and diapers** for infants and toddlers
- ☐ **Toilet paper**

- ❑ **Feminine hygiene supplies**
- ❑ **Garbage bags and plastic ties** for disposing waste
- ❑ **Copies of important family documents** such as insurance papers, wills and trusts, deeds, birth certificates, prescription forms signed by a doctor and medical records, including immunization records. Keep the originals in a bank safety deposit box.
- ❑ **Checklist of items in container**

Know how to shut off your gas, water and electricity in case you need to evacuate. Keep the necessary tools handy, along with a flashlight. You will also need a pair of pliers or a wrench. Contact your utility company for more information.

Respond Quickly

If a flood watch has been issued or if flooding is likely, move essential items and furniture to upper floors of the home. Bring outside possessions inside, or tie down any movable objects that might be washed away. Unplug any electrical appliances that you can't move. If you have a cell phone, be sure to keep a portable phone charger in your vehicle. Lock all windows and doors.

If your house doesn't have a basement, then stacking sandbags around it can help protect against flood damage. If your house has a basement, you should not stack sandbags around the outside of your house. The water will seep through the soil and collect around the basement walls. This could create more pressure on the outside of the basement than on the inside, and damage the foundation and walls. Usually, it is better to let the basement flood.

If a flood warning has been issued, authorities have advised you to evacuate, or there is any possibility of a flash flood occurring where you are, move to a safer location. When you leave, shut off utilities, take your emergency kit with you and check the door to make sure it is locked. If you have personal flotation devices for boating, take these with you. When driving, listen to the radio for news updates, and follow instructions given by authorities.

Never enter floodwaters in a vehicle or on foot. However, if water rises and your vehicle stalls in a flooded area, abandon it and get to high ground. Almost half of all flash flood fatalities occur in vehicles, including trucks and SUVs. Exercise extreme caution if driving at night – flooded roadways can be very hard to see in the dark. **Remember: Turn Around – Don't Drown!**

Keep a flashlight or noise-making device (such as a whistle) with you to attract help. If you become trapped in floodwaters, hang on to something that floats or is stable until rescue comes. You can also tie knots in shirtsleeves or pant legs to serve as a life vest by trapping air in them.

Going Back Home: Is the Danger Really Over?

Do not attempt to re-enter flooded or flood-damaged areas unless local authorities tell you it is safe to do so. When you are allowed to re-enter the area, remember that some floods have more than one crest and floodwaters may rise again. Be prepared to leave the area quickly, and exercise caution at all times.

Before re-entering the area, be sure that you have had a tetanus booster shot within the past ten years. Tetanus from debris is a threat in any area that has been flooded. If you cannot recall when you got your last tetanus booster, consult with the local health department or doctor's office about being vaccinated against tetanus.

Be especially alert for downed power lines and notify authorities if you see them. Do not approach or touch these lines, or anything that they are touching. Never touch any electrical equipment if the ground is wet.

Be very cautious when re-entering your home. It is best not work in or around any flood-damaged building unless you can be sure it is structurally safe. Never touch any electrical equipment or appliances if the ground or floor is wet. If a gas leak is suspected, leave the area immediately and call 9-1-1.

When you do return to your home, you'll need the following:

- Flashlight (do not use candles or kerosene lanterns due to fire hazard)
- Battery-operated radio
- Waterproof boots
- Dust mask rated as "N-95" (it should say this on the package.)
- Camera to record flood damage for insurance purposes
- Tools: gloves, crowbar, hammer, pliers, wrench, screwdriver
- Cleaning supplies (detergents, bleach, 1-gallon bucket, disposable sponges, rags, etc.)

Enter your home with caution. The floor probably will be slippery from water and mud. Watch for snakes, other animals, loose floorboards, holes and nails. Look for tall pieces of furniture that might be ready to fall over. Floors may be dangerously unstable from prolonged contact with floodwaters. Be extremely cautious, and leave immediately if you hear an unusual noise or if there is sudden, unexpected shifting of any kind.

Cleaning Up After a Flood

Wear boots, rubber gloves, long pants, a long-sleeved shirt and an N-95 rated dust mask to provide some protection against contaminants. If you prefer, you can use disposable coveralls to protect your clothing – these can usually be obtained at a hardware store. Clothing should be thoroughly laundered after use. Leave the home immediately if you experience breathing problems, dizziness or any other signs of illness. Most of the health hazards will come from contaminated mud the floodwater left behind, so it is important to get rid of the mud as soon as possible. If you wait for the mud to dry before cleaning, the bacteria in the mud will have time to grow, possibly creating a health hazard.

Remove pictures and mirrors from wet walls, and then scrub indoor areas including shelves, under refrigerators, stoves, and cabinets and in play areas. A solution of soap or detergent in water is recommended for scrubbing surfaces clean. After scrubbing, rinse with water that contains no more than 1 cup of unscented liquid laundry bleach for each gallon of water to disinfect the area. Allow the bleach solution to remain in contact with surfaces for at least 10 minutes in order to successfully disinfect. Never mix bleach with ammonia or other cleaners.

Remove any water trapped in walls. Take off the baseboard and stick an awl or knife into the wall two inches above the floor to see if there is water behind the wall. If water drips out, cut a hole with a manual or cordless drill to allow water to drain. Depending on spacing between studs, make a hole every 16 or 24 inches, but watch out for wiring, which is usually at the same height as the electrical outlets. Most ceilings and walls are covered with wallboard. Wallboard acts like a sponge because it draws water above the actual flood level, so water inside the walls will have reached higher than the high-water mark.

Wallboard that has been soaked by floodwater can be a health hazard because it will harbor bacteria and mold. Because water will wick up into walls, you should plan on removing wallboard to a point at least 12 to 18 inches above the highest level the floodwater reached. If it was soaked by clean rainwater, it can be dried in place provided that it can be dried quickly enough – usually within 24 to 48 hours. It may be necessary to cut inspection holes in the wall to visually inspect the wall cavity for moisture and mold.

Discard fibrous insulation such as cellulose, fiberglass or mineral wool that has been contaminated with floodwaters. Insulation that has gotten wet will compress, losing its ability to insulate properly. It can also lose its fire retardant and anti-fungus capabilities; so all insulation that got wet should be replaced.

Assume that tile, laminate (synthetic) wood and linoleum floor surfaces have water trapped beneath them. Remove part of the flooring surface in affected areas of your home to see if moisture has penetrated to the wooden structural floor beneath. If it has, remove any flooring material that covers the damp areas, and clean and dry the structural wood floor beneath. Also, clean and dry the underside of the flooring materials before replacing them. Some linoleum tile or sheet floor materials may contain asbestos and should only be removed by licensed professionals.

Remove all floodwater and mud from the house as soon as possible. Use a mop, squeegee or wet/dry vacuum cleaner (if you have an outside source of power). Also, check for broken or leaking water pipes, and turn off water valves for any of these pipes. If appliances are wet, dry them out and reconnect and turn them on only after they are dry – make sure you are not wet or standing in water when doing so. If gas appliances were flooded, clean the mud out of the pilot and burners. Be sure the gas is turned off before cleaning gas appliances.

Protect your valuables. Find valuables such as money, jewelry, insurance papers and family pictures. If it is possible, wash mud off of these items before they dry. If you can't clean papers immediately, put them in a working freezer until you can to protect them from mildew and further damage.

Hose the house down, inside and out. If possible, use a hose attachment that sprays soap, then rinse the walls and floors, along with furniture and other large items that got muddy. Open light sockets and electrical boxes, then hose them out. Also, remove all cover plates on wall switches and outlets. It's best to replace switches and outlets that were flooded. Hose out heating and air conditioning ducts. Do not use heating or central air until ducts have been cleaned and dried out.

After cleaning, dry the home out thoroughly and quickly. Use fans to aid in evaporation of the moisture and dehumidifiers to then remove moisture from the air. For fastest drying, the house should be closed up. Outside air is typically very humid following a flood. Open closet and cabinet doors and remove drawers. Open the back of the cabinet if the drawers are stuck.

Don't be in too much of a hurry to get the water out of your basement. If you drain the basement too quickly, the water on the outside will put pressure on the walls and may make them crack, or even collapse. Pump the water level down two to three feet. Mark the level and wait overnight. Check the water level the next day. If the water has risen to the mark, it's too soon to drain the basement. Wait a day, and then pump the water down two or three feet again. Check again. When the water stops rising, pump two to three feet a day until all water is pumped out. Before you pump out water, make sure the electricity is off, and operate generators with caution.

Mold and bacteria will grow on wet or damp materials. Parts of the house or contents that came into contact with water are obvious problem spots, but mold can affect upper floors and other parts of the house as well because of the moisture in the air. Anything that has been wet or subjected to long periods of dampness, such as in a basement, should be carefully inspected and either discarded or cleaned.

Mold cleanup. In most cases, if visible mold is present, there is no need to test for mold. Any molds that are growing indoors, regardless of the type, will need to be taken care of in the same manner. Household items and building materials that cannot be effectively cleaned should be discarded.

Thorough cleaning with soap or detergent in water will safely and effectively **remove** mold and bacterial contamination. Bleach or other products that are used to try to **kill** mold or bacteria are usually not necessary and can damage some surfaces. If disinfection is desired, mix no more than 1 cup of unscented bleach in 1 gallon of water, wipe surfaces and allow them to remain damp with this solution for at least 10 minutes. Never mix bleach with ammonia or other cleaners.

What can be cleaned? Building materials and contents that are relatively non-absorbent can usually be cleaned. Contamination on the surface of items made of metal, glass, plastic, concrete or solid wood can be washed off with detergent and water. Wood studs can be cleaned; so can dinnerware and cooking utensils. For solid wood furniture or wood trim in the home, select a cleaner designed for wood finishes to avoid any additional damage to the finish. Clothing, sheets and towels can be laundered. If they come out looking good and smelling good, they are clean. If they are permanently stained or still have an odor, then discard these items.

What should be discarded? Moldy building materials and contents that are absorbent and cannot be laundered should be discarded. Carpet and pad that has been soaked with floodwater cannot be cleaned thoroughly enough and should be discarded. In the case of high-value area rugs, commercial cleaning may be considered. Upholstered furniture, mattresses, pillows, stuffed animals, and similar items that have been soaked should be discarded. Books and other paper materials will also usually need to be discarded. Photographs, books and papers that have sentimental or monetary value should be placed in bags and frozen to reduce mold growth until professional help can be obtained to preserve and restore these items.

Throw away any food that might have spoiled or become contaminated. These include:

- Any food that has come into contact with floodwaters
- Any frozen foods that have thawed. If the door is kept closed, a full freezer will keep food frozen for 2 days and a refrigerator can keep food cold for 4-6 hours.
- Any food items remaining in opened containers or packages, foil or plastic-wrapped packages, unopened jars and bottles with paper seals like mayonnaise or with paraffin seals like jams and jellies or containers with non-sealed, fitted lids like cocoa or baking powder
- Any food items in paper, cloth fiber or cardboard boxes even if they seem dry (e.g., cereals, pasta, rice, cookies and crackers)
- Any food items stored in containers with dented seams, or which are bulging, rusty or leaking, and cans which have been tossed about and are found far from their normal storage spot
- Spices, seasonings, flavorings, sugar, coffee, flour and other grains
- Commercially bottled carbonated beverages like soda if the cap is crusted with silt.
- Fresh foods including vegetables and fruits or meat, fish and poultry
- Any food that looks or smells bad, but you cannot rely on appearance or smell alone to tell if a food is contaminated. **When in doubt, throw it out!**

Take care of yourself during cleanup activities. Set priorities for cleanup. Space the work over several days or weeks to avoid becoming exhausted or ill. Heat can cause heat stroke, heat exhaustion, cramps and fainting. Drink some water every 15 to 20 minutes. Avoid alcohol and caffeinated beverages such as coffee and soda – these can cause the body to dehydrate more quickly. Wear light, loose clothing. Work during the cooler hours as much as possible, but avoid dusk and dawn to reduce the chance of being bitten by mosquitoes, which can carry disease (see below). Get plenty of rest and take frequent breaks. Open windows and use fans if there is no air conditioning. Wear high rubber boots and avoid working alone. Change into dry clothing when possible.

Other Health Risks in Flooded Areas

In response to flooding, local or state officials will announce boil water advisories if they have concerns about the safety of public water supplies. Flooding can contaminate public water supplies, and make well water dangerous to drink. Showering or bathing is generally safe, but make sure you do not get the water into your mouth. Small children should be closely supervised to make sure they do not ingest bathwater. Open sores, cuts or other wounds can also allow harmful bacteria to enter your body. If you have breaks in your skin, avoid showering or bathing until you are able to use water that is safe, or until you have healed.

Observe the following precautions until officials announce the water is safe:

- Boil water for one minute prior to drinking or food preparation, or use bottled water. If you don't have power and cannot boil your water, add household bleach instead. Five drops of bleach should be added for each gallon. Mix this thoroughly and let it stand for 30 minutes to kill any bacteria.
- Dispose of ice cubes and do not use ice from a household automatic icemaker.

- Disinfect dishes and other food contact surfaces by immersion for at least one minute in clean tap water that contains one teaspoon of unscented household bleach per gallon of water.
- If your tap water appears dirty, flush the water lines by letting the water run until it clears.

To clean and disinfect your private water well, follow these steps:

1. Pump the well out thoroughly to remove all floodwater.
2. Remove all mud, silt and sediment from the well. The walls and curbing of dug wells should be washed down to remove any mud or sediment that may have collected on the walls. Bailers may be needed to remove mud from the bottom of the wells.
3. Repair the well, if necessary, to prevent surface water from entering the well.
4. Pump the well until the water runs clear.
5. Disinfect the well. For drilled wells, mix one gallon of unscented laundry bleach containing at least 5.25-percent active ingredient (Clorox, Purex, etc.) with four gallons of water. This amount should be sufficient to disinfect 100 gallons of well capacity (a 4-inch well that is 100 feet deep will have a volume of 65 gallons). For hand-dug wells, use two gallons of bleach. Pour this solution into the well and mix. For shallow wells, a reinforced garden hose may be used to distribute the solution in the well vertically.
6. Run water from each tap and faucet until the smell of chlorine is present. Allow the chlorine to remain in the system for 12 hours. Then, run the water until the taste and smell of chlorine is no longer present.
7. Contact your local health department in 10-14 days to collect a sample for analysis.

The above recommendations are effective for removing bacterial contamination only. If you have reason to believe your public water supply or private well has been contaminated with chemicals, you should instead rely on bottled water, or temporarily relocate to an area that has a safe water supply.

Stagnant water allows mosquitoes to breed, and mosquitoes can carry disease. Mosquitoes lay their eggs in stagnant water and can carry diseases that can prove severe or even fatal. Drain water from buckets, wading pools, tarps, birdbaths, old tires and anything else that holds water. Clean out the gutters. For water that can't be drained, apply mosquito larvicide. Wear an insect repellent containing picaridin or DEET on your skin according to label directions, along with long sleeves and pants, to protect against mosquito bites. Avoid working outdoors at dusk and dawn when mosquitoes are the most active.

Gas-powered pumps or generators can create dangerous carbon monoxide (CO) fumes.

Place gas-powered equipment outdoors, at least ten feet away from windows and doors where the fumes can enter the home. **Never** operate gas-powered equipment indoors, including inside a garage. Even with doors open, carbon monoxide can quickly build up to unsafe levels that can lead to loss of consciousness and death. The most common symptoms of CO poisoning are headache, dizziness, weakness, nausea, vomiting, chest pain and confusion, but symptoms alone cannot be relied upon as an indicator of CO poisoning. Some adverse effects may not show for days or weeks. Seek medical help right away if CO poisoning is suspected.

Additional Information

For additional information on flood safety and preparedness, contact your county emergency management office, local health department or county extension service, or visit these Web sites:

- **Centers for Disease Control and Prevention (CDC)**
www.bt.cdc.gov/disasters/floods
- **Department of Homeland Security**
www.ready.gov
- **National Oceanographic and Atmospheric Administration (NOAA)**
www.noaa.gov/floods.html
- **Federal Emergency Management Agency (FEMA)**
www.fema.gov/hazard/flood

You can also call the **Kansas Department of Health and Environment (KDHE)** main number at (785) 296-1500, or any of the **KDHE District Offices**:

- **KDHE North Central District Office (Salina)**
(785) 827-9639
- **KDHE Northeast District Office (Lawrence)**
(785) 842-4600
- **KDHE Northwest District Office (Hays)**
(785) 625-5663
- **KDHE South Central District Office (Wichita)**
(316) 337-6020
- **KDHE Southeast District Office (Chanute)**
(620) 431-2390
- **KDHE Southwest District Office (Dodge City)**
(620) 225-0596

